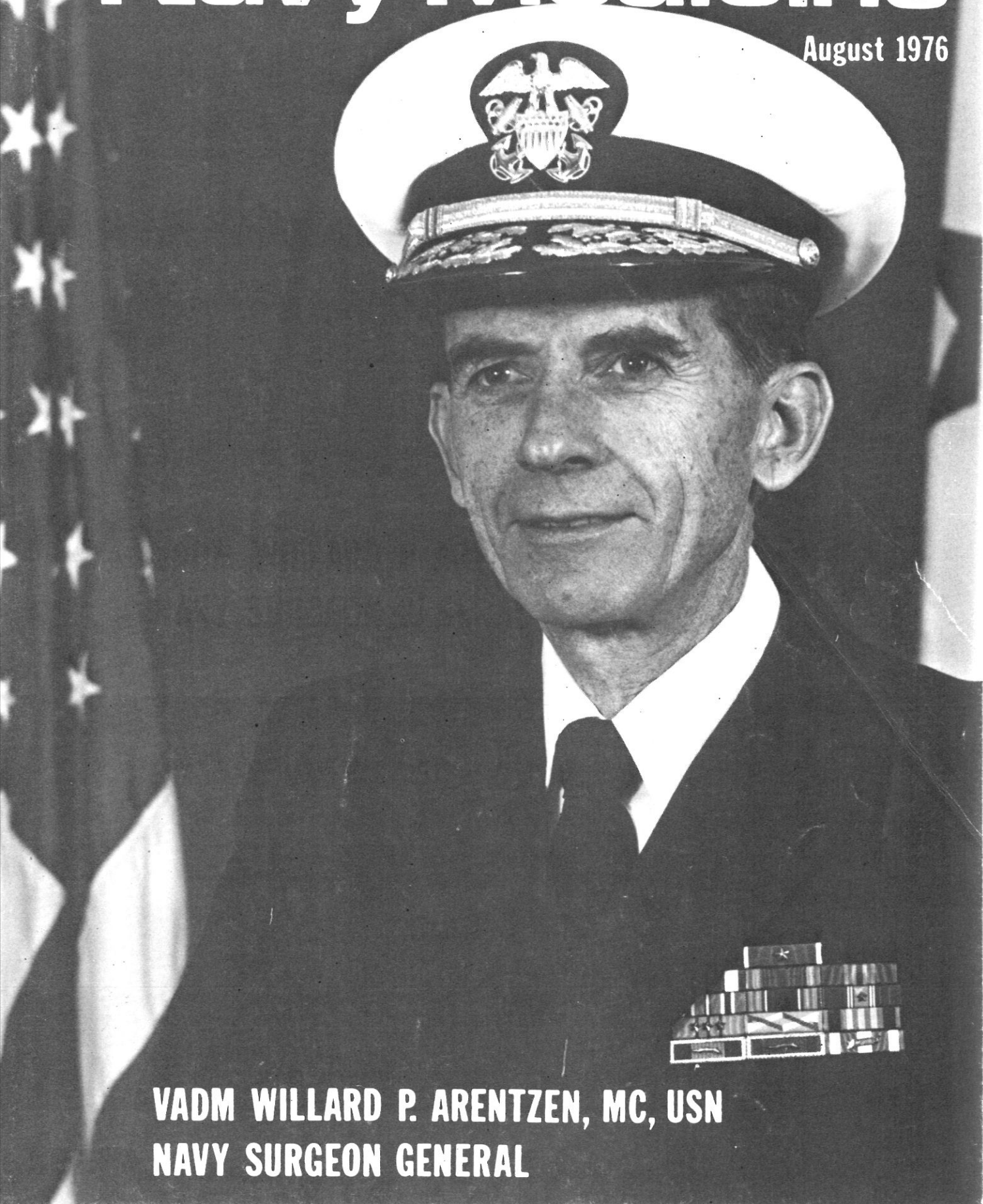


U.S. Navy Medicine

August 1976



**VADM WILLARD P. ARENTZEN, MC, USN
NAVY SURGEON GENERAL**

VADM Willard P. Arentzen, MC, USN
Surgeon General of the Navy

RADM Paul Kaufman, MC, USN
Deputy Surgeon General

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U.S. NAVY MEDICINE

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COVER: The Navy's 27th Surgeon General, and the 31st Chief of the Bureau of Medicine and Surgery, is Vice Admiral Willard P. Arentzen (MC). A review of Admiral Arentzen's career appears on page 1. Beginning on page 20, the new Surgeon General describes successful efforts to reduce the average length of patient stay at Naval Regional Medical Center San Diego.

Department Rounds

BUMED

The Navy's New Top Doc

Navy medicine has a new leader: VADM Willard P. Arentzen (MC), 27th Surgeon General of the Navy and 31st Chief of the Bureau of Medicine and Surgery. He succeeds VADM Donald L. Custis (MC), who retired on 1 August.

The new Surgeon General comes to BUMED from Naval Regional Medical Center San Diego, where he had been commanding officer since 1974. Known as a strong, innovative leader, Admiral Arentzen reduced the average length of stay of active-duty inpatients at that facility 64% (see "Reducing Length of Patient Stay," page 20), and improved the medical center's support of the Pacific Fleet. Under his direction, NRMCC San Diego became the first American hospital to use CompuText, an advanced word processing system that helped wipe out a large backlog of medical transcriptions.

VADM Arentzen established the medical center's Environmental Health Service to coordinate regular safety surveys of San Diego naval bases. Under his leadership, 11 area dispensaries were regionalized and the fleet medical pool system was established on the West Coast. Admiral Arentzen also initiated the practice of sending consulting psychiatrists to meet arriving ships.

Born 5 June 1921 in Kirkwood, N.J., VADM Arentzen graduated from Temple University, Philadelphia in 1943 and earned his M.D. degree at Hahnemann Medical College, Philadelphia in 1946. Commissioned in the Medical Corps of the Naval Reserve in 1946, he interned at Naval Hospital Chelsea, Mass., subsequently serving in the USS *Yosemite* and USS *Vulcan*, and

at Naval Hospitals Newport, Bethesda (as medical resident), and Philadelphia. He transferred from the Reserve to the regular Navy in 1950.

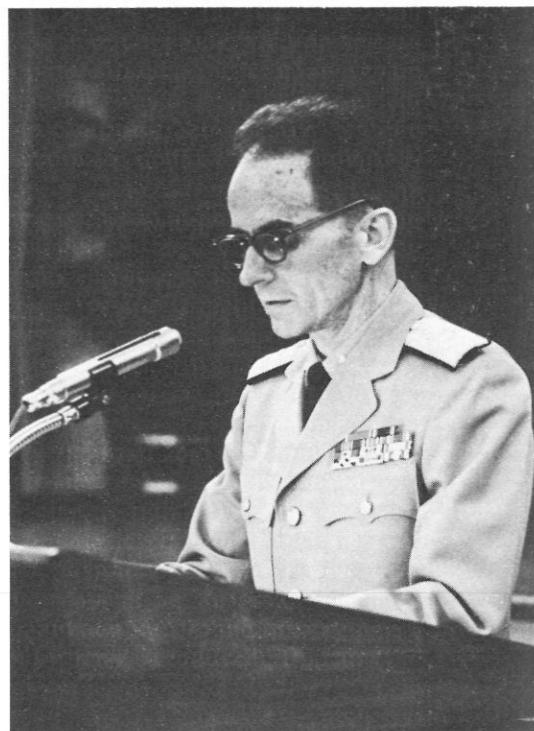
Legion of Merit. After a tour of duty at the Naval Facility London, England (1953-1955) and residency training at Naval Hospital Bethesda, VADM Arentzen reported as assistant chief of the medical service at Naval Hospital Camp Lejeune, N.C. in 1956. From 1959 to 1964 he was head of planning and special projects for the Medical Corps Division, BUMED. After serving as executive officer of Naval Hospital Annapolis, he assumed command of the naval hospital in USS *Sanctuary* in 1968, earning the Legion of Merit for exceptionally meritorious conduct during combat support operations. His citation states:

CAPT Arentzen directed the operations of the hospital most effectively and efficiently in the support provided to the I Corps Tactical Zone of the Republic of Vietnam. With the hospital providing services on station for periods up to 120 days, he instilled in his subordinates a determined devotion to duty which enabled them to contribute maximum efforts for extended periods of time. This complete dedication made it possible for the hospital staff to handle the peak admission loads of the 1969 TET offensive and other periods in a noteworthy and admirable manner.

Admiral Arentzen assumed command of Naval Hospital Camp Lejeune in 1969. In 1971 he became deputy director, and in 1972 commanding officer of Naval Regional Medical Center Portsmouth, Va., with additional duty as chief medical officer for the Fifth Naval

District. While in that assignment, he was awarded a second Legion of Merit for outstanding support of Operation Homecoming (February-April 1973). He was cited for the highly professional manner in which he handled the many responsibilities occasioned by the return from Vietnam of former prisoners of war.

In addition to two Legion of Merit awards, VADM Arentzen holds the Navy Unit Commendation Ribbon, American Campaign Medal, World War II Victory Medal, National Defense Service Medal with bronze star, Vietnam Service Medal with



Dr. Arentzen at 1972 conference
A strong, innovative leader

three stars, and Meritorious Service Medal. The Republic of Vietnam awarded him the Navy Distinguished Service Order Second Class, Armed Forces Honor Medal First Class, Republic of Vietnam Campaign Medal with Device, Republic of Vietnam Armed Forces Meritorious Unit Citation (Gallantry Cross), and Republic of Vietnam Department of Public Health Commendation.

Dental

Going Strong at 64

*Will you still need me . . .
When I'm 64?*

The Beatles

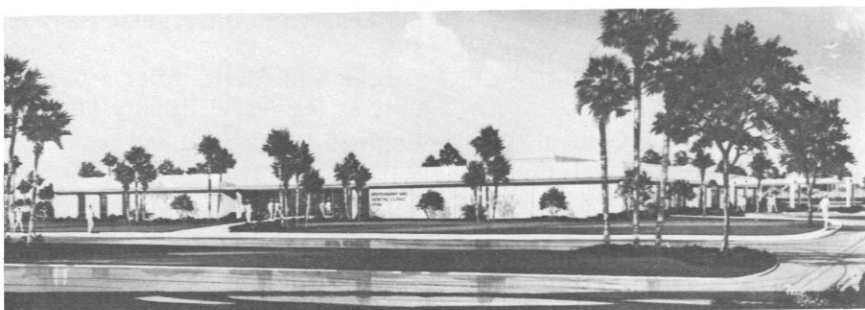
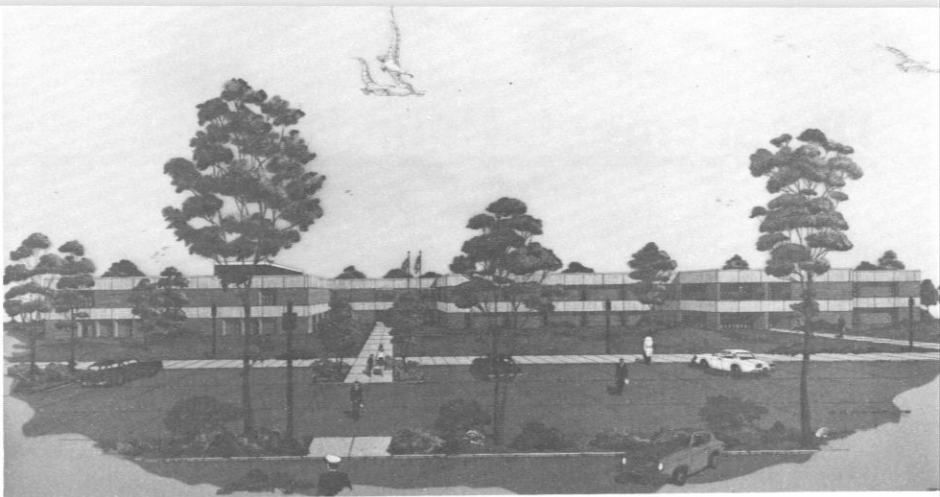
The Navy Dental Corps turns 64 this month, and there's no question about being needed: 24 new dental clinics going up this fiscal year are tangible evidence of that. So are the 14.5 million dental procedures accomplished during FY75, and the 11.6 million dental procedures done in the first three quarters of FY76.

The Act that established the Dental Corps on 22 August 1912 authorized the Secretary of the Navy to appoint not more than 30 acting assistant dental surgeons. Today there are more than 1,700 dental officers on active duty, supported by more than 2,800 dental technicians.

The Dental Corps' chief concern is caring for the active naval forces. The goal: to prevent and remedy dental disease which could interfere with military duties and adversely affect operational readiness. Besides this primary mission, Navy dental officers care for other authorized beneficiaries as time and resources permit.

Recent efforts have brought striking improvements to Navy dental health care. With the approval of the Chief of Naval Operations, 19 regional dental centers have been established. The third phase of the dental regionalization program, also approved and now under way, will incorporate most remaining dental shore facilities within dental regions, and place most Navy dental officers under BUMED's manage-

"When I'm 64." By John Lennon and Paul McCartney. Copyright Northern Songs Limited, 30 May 1967.



Now under construction: (top to bottom) Naval Regional Dental Center San Diego; branch medical/dental clinic, Naval Station Mayport, Fla.; and medical/dental clinic, Naval Submarine Base Bangor, Wash.

ment and technical control: 70% of those officers will serve in naval regional dental centers, 10% in naval hospital dental services.

Except for residencies in oral surgery and general dentistry, which are held in naval training hospitals, Navy inservice training programs for dental officers have been consolidated at the National Naval Dental Center. Training is provided to meet the Navy's established requirements for officers with specific expertise.

Navy dental officers continue to display a high degree of professionalism: they provide high-quality dental care, participate in clinics,

present lectures at professional meetings, write for professional journals. Through the Navy's advanced dental education programs, dental officers have become highly skilled in comprehensive general dentistry. Many Navy dental specialists are certified by American specialty boards.

The Navy Dental Research Program continues to respond to Dental Corps requirements for cost effective treatment and prevention procedures. A recent search for better methods to treat orofacial battle injuries showed radioisotope screening to be a valuable tool for assessing healing after mandibular

bone grafts. Navy dental researchers have also found that freeze-dried allogeneic skin grafts are effective in the surgical treatment of periodontal disease. In a search for a way to prevent dental caries, Navy dentists are investigating chemoprophylactic and vaccine techniques which reduce the pathogenicity of

certain oral microorganisms.

An optimistic, determined and dedicated Dental Corps marks its 64th anniversary, aware that it is doing its best to improve the dental health of the nation's Navy, and to provide reliable support for the CNO's objectives: operational readiness and greater productivity.

Aviation

Flight Surgeon Par Excellence

LT Wayne F. Judson (MC) was named Navy operational flight surgeon of the year, and Navy flight surgeons formed their own society at the 47th Annual Scientific Meeting of the Aerospace Medicine Association, held 10-13 May in Bal Harbour, Florida.

LT Judson also received the second annual Richard E. Luehrs Memorial Award, established in memory of CAPT Luehrs, a Navy flight surgeon for 32 years.

Now flight surgeon for Helicopter Training Squadron 18 at Naval Air Station Whiting Field, Florida, LT Judson was honored for his work evacuating Vietnamese refugees from Saigon in April 1975. At that time, he was staff medical officer for the Ninth Marine Amphibious Brigade, a special mission contingency group responsible for the evacuation.

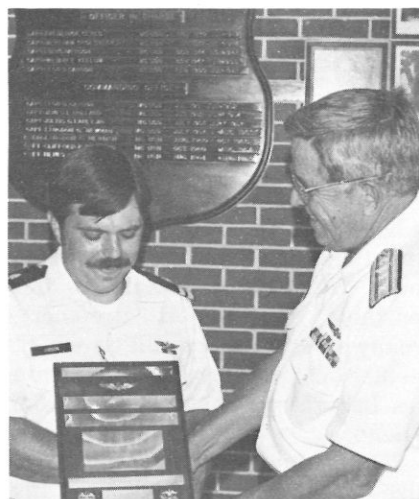
LT Judson was designated a naval flight surgeon in December 1974. He is a graduate of the Naval Aerospace Medical Institute, Pensacola, Florida.

New Society. CAPT William W. Simmons (MC), head of the Bureau of Medicine and Surgery's Aerospace Medicine Operations Branch, was elected first president of the new Society of U.S. Navy Flight Surgeons. CAPT Richard J. Seeley (MC) is vice-president; CAPT Wayne O. Buck (MC), secretary and treasurer.

Membership in the Society is open to flight surgeons, aviation

medical officers and aerospace medical examiners who are on active duty or have had at least two years of active duty with the Navy or Coast Guard, or who are naval Reservists in a Selected Reserve or inactive status. Active-duty members of the other U.S. armed services, and military personnel of allied nations may also join if they are graduates of the Naval Aerospace Medical Institute. Retired Navy flight surgeons may join as emeritus members.

CAPT Frank H. Austin, Jr. (MC) was named president of the Aerospace Medicine Association for 1976-77. He succeeds J. Harold Brown, M.D., and will officiate at the Association's 48th Annual Sci-



LT Judson (left)
Navy Flight Surgeon of the Year

entific Meeting, to be held in Las Vegas 9-12 May 1977.

The first of four flight surgeons to complete Navy test pilot training, CAPT Austin is director of BUMED's Aerospace Medicine Division and program coordinator for aircrew life support equipment in the Office of the Deputy Chief of Naval Operations (Air Warfare). He is active in aeromedical safety, has developed, tested and evaluated safety and survival equipment, and has monitored stress and performance in operational and combat flying.



CAPT Austin with J. Harold Brown, M.D.

Here Comes Superstretcher

Transporting combat casualties to a hospital without further endangering their lives can be tricky business. But help is at hand: a new portable life support stretcher—really an emergency unit on wheels—just designed by Naval Electronics Laboratory Center (NELC), San Diego.

The mobile unit looks something like an ambulance without walls. The stretcher has two basic parts: a removable standard canvas litter, and an equipment carrier that takes up no more room than a standard litter. Attached to the carrier are an electrocardiogram monitor, a defibrillator, and oxygen cylinders. Supplies are arranged in the order they would be used in emergencies: airway devices, a respirator, and a suction unit are stored in the drawer nearest the patient's head, and two more drawers hold drugs, intravenous supplies, a blood pressure unit, dressings, a resuscitator, and other supplies.

With this equipment, the attending physician or corpsman can provide uninterrupted care and

monitoring en route to a definitive care center. "With improved management of trauma patients, the mortality rate of military casualties has been steadily reduced," says John Silva, Ph.D., head of the NELC Biosystems Engineering Group. "A prime factor in this reduction has been the rapid transfer of casualties." The role of the transporting vehicle would be greatly enhanced if the capability offered by the portable stretcher were available during the transportation phase of medical evacuation operations, Dr. Silva says.

Electronic wheelchair. The stretcher is one of several advances in medical instrumentation recently made at the electronics lab. Another is an electronic wheelchair that allows a paraplegic to stand and move in any direction. While a padded bar holds the patient's knees in place, a linkage system, powered by two jack screws, raises a webbing belt beneath the patient, enabling him to stand erect. The procedure takes about six seconds. With this Stand Aid wheelchair, a

paraplegic can work at a stand-up bench or at a file drawer—tasks he couldn't handle before. The patient's blood circulation improves when he stands, and there is less loss of bone calcium.

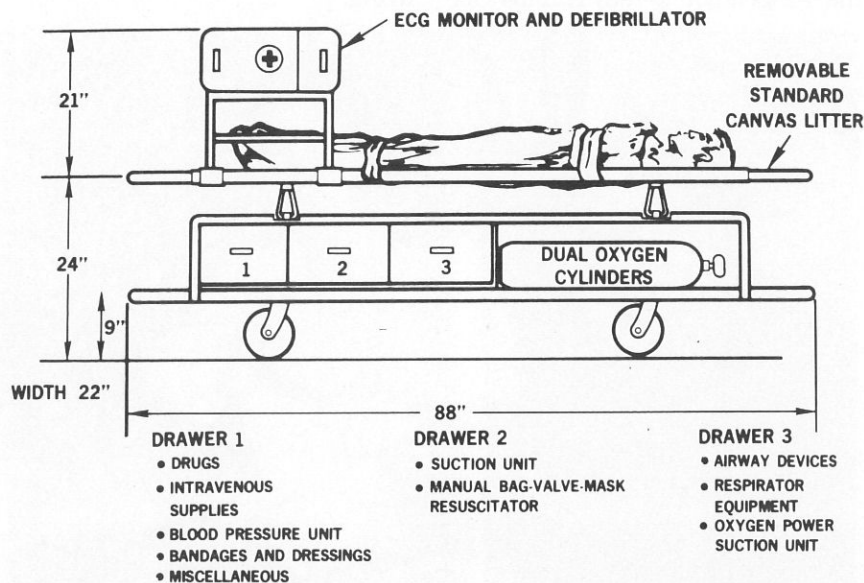
Development of four prototype chairs was funded by the Veterans Administration; the chairs will be tested at VA hospitals in early 1977. The next step in the chair's evolution will be a detachable platform, the size of an attache case, to help paraplegics move into small spaces and corners while standing. This would make it easier for them to teach at a blackboard or use a closet, for example.

Another wheelchair developed at NELC allows quadriplegics to move around. A headrest assembly converts the patient's head movements into electrical signals to drive the motorized chair.

Perhaps the best known of NELC brain children is the remote medical diagnosis system, recently tested in its first real emergency. An independent duty corpsman aboard the USS *Alamo* sent a picture of a crewman's crushed finger to a physician in the USS *Juneau* via the remote system (see *U.S. Navy Medicine*, April 1976).

A continuous, noninvasive blood pressure monitor is the lab's latest inspiration. The device does not require an arterial catheter; instead, a small balloon, which rests against the patient's pulse, is attached to an integrated circuit hooked up to a minicomputer. Variations in the air inside the balloon are translated into electrical signals by the circuit. The computer then converts these signals into blood pressure and heart rate readings.

The lab's next project: figuring out a way to use this blood pressure monitor on a patient in motion, such as a person running on a treadmill in a stress test. After that, John Silva predicts more ingenious devices: "Some of us remember the ideas in the old Flash Gordon cartoons. They seemed futuristic at the time, but they later came true. So don't be surprised at anything."



Portable life support stretcher unit concept

Open Letter to the Medical Service Corps

As the Medical Service Corps celebrates its 29th anniversary this month, and as our country proudly commemorates its bicentennial year, I would like to bring you up to date on the state of the Corps and its relationship to important recent developments in the Navy Medical Department.

In today's austere fiscal environment, the Medical Service Corps, like all military communities, is feeling the pinch and attempting to meet added responsibilities with reduced resources. One bright note is that the Medical Service Corps budget is being cut less than the budgets of the other communities. Our most serious loss was 19 optometry billets in FY77—a 15% reduction in a critical resource. We have done everything possible to reclaim these billets, to no avail. Since the political and economic moods of the country continue to move away from supporting the Department of Defense, it is possible our billet reductions will continue.

For the past year, issuing a Medical Department member orders to an activity without a vacant billet has been prohibited. We expect this prohibition to continue under what is popularly referred to as the "billet-body" concept, designed to correct imbalances by placing billets and bodies in equilibrium with each other. The effect of the prohibition is some loss of flexibility in granting assignment preferences, such as requests for specific geographic locations.

I am very pleased to report that applicants for the Medical Service Corps are abundant—from both the civilian and Navy communities. Their credentials are superb. Table I is a chart of our accessions, current and planned, for FY76, FY7T, and FY77.

Augmentation. Because augmentation is increasingly competitive, the fitness report remains extremely important. Interestingly enough, the chances for augmentation are about the same for the officer with a 2302 designator as for the 2305 officer. These two officer groups do not compete against each other, only against other applicants with the same designator. Officers with the 2305 designator (Reserve officers) must be successfully augmented before they have five years' commissioned service in the Medical Service Corps or they will be released into inactive status. Some 40% of Reserve officers who apply for augmentation are successful. Because officers with the 2302 designator (temporary officers) are not forced out if they do not augment, they don't compete with Reserve officers for augmentation. One caveat: temporary officers must retire as soon as they have served 30 years.

Tentative dates have been set for

the FY77 augmentation boards to meet: 5 October 1976, 15 February 1977, and 30 August 1977. This is a departure from the old quarterly convening dates.

Training. We now have these 102 training billets for Medical Service Corps officers:

Navy Postgraduate School, Monterey, Calif.	7
Marine Corps Development and Education Command, Quantico, Va.	1
Armed Forces Staff College, Norfolk, Va.	1
Naval School of Health Care Administration, Bethesda, Md.	40
Pharmacy resident, NNMCM, Bethesda, Md.	1
Podiatry resident, Naval Hospital Beaufort, S.C.	1
Aerospace physiology training, Naval Aerospace and Regional Medical Center, Pensacola, Fla.	3
Aerospace psychology training, Naval Aerospace and Regional Medical Center, Pensacola, Fla.	1
Clinical psychology resident, NNMCM, Bethesda, Md.	4
Health care resident, BUMED, Washington, D.C.	1
Outservice civilian schools	42

TABLE I. Medical Service Corps Accessions
FY76, FY7T (planned) and FY77 (planned) by specialty

Section	FY76	FY7T	FY77
Medical Allied Sciences (Direct)	56	7 (6*)	11
(1995-Clinical Psychology)	5	5	7
Medical Specialist (Direct)	5		1
(1935-Physical Therapy)	8	2	2
(1935-Occupational Therapy)	2		
(1935-Dietetics)	3		
Optometry (Direct)	2		
(1995)	43		26
Pharmacy (Direct)	10	5 (2*)	5
Podiatry (Direct)	5	1	1
Health Care Administration (Direct)	5	2	
(1935)	31	14	30
(Inservice)	25	25	**
Total	200	61 (8*)	83

*Identified vacancies; now being recruited.

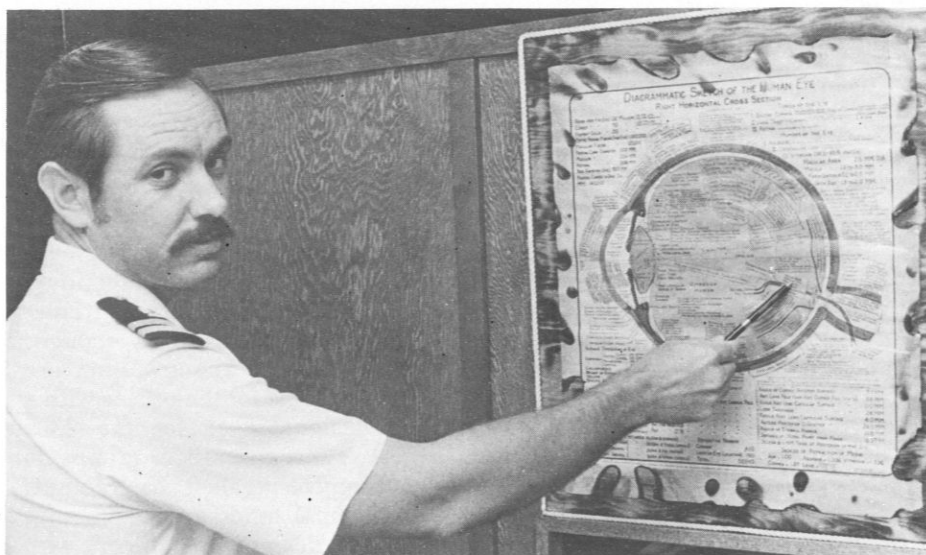
**Determined annually based on strength requirements.

These billets are distributed as equitably as possible throughout the Corps. Selection for training is based on Corps requirements, the program requested, and the applicant's past performance: A specialty adviser represents each MSC specialty on the selection board which meets every November to pick officers for training.

Expanding responsibilities. The opportunities for MSC officers to lead and command continue to grow. During the past year MSC officers have taken command of several naval hospitals which are echelon 4 component commands of regional medical centers. MSC commanding officers and officers in charge have demonstrated great proficiency, contributing significantly to the viability of the Navy's health care system. MSC commanding officers are being considered for other hospitals and branch clinics, to allow the Medical Department to make the fullest use of scarce resources. Medical Department facilities currently under the direction or command of MSC officers include:

- 5 naval hospitals (1 more to be added in September)
- 39 medical clinics
- 6 medical training activities
- 3 Marine Corps medical units
- 2 disease vector ecology and control centers
- 2 Human Goals Programs
- 1 Medical Materiel Support Command
- 1 research activity
- 1 Medical Data Services Center
- 1 naval ophthalmic services and training unit

Changes. The nomenclature for Navy health care facilities is being realigned to meet revised DOD criteria. There will be two types of inpatient medical facilities—medical centers and hospitals—and a single designation, clinic (formerly dispensary), for outpatient facilities. Clinics will not be authorized operating beds, but may maintain beds for patients who await transfer or do not require hospitalization. The term *dispensary* will no longer be used. This change in nomenclature should not affect our officer in charge billets.



Optometrist LT Don Longacre
A critical resource reduced

Promotions. In early 1976, we were optimistic that the present Congress would pass the Defense Officer Personnel Management Act. Our optimism has waned somewhat. Looking ahead, we cannot be very confident, but the following possibilities *could* become real if this legislation is passed and implemented:

- Flag rank for the Medical Service Corps.
 - Promotion selection boards composed solely of MSC officers.
 - Abolition of the line running mate system, affording more equitable promotion opportunities for MSC officers.
 - Deep selection possibilities for lieutenant commanders.
 - Elimination of 100% selection opportunity for lieutenant commanders.
- Again, I stress that these are only possibilities.

Promotion eligibility zones have been published for FY77. Convening dates for selection boards have been changed. They are:

Captain: 27 July 1976; 6 July 1977
 Commander: 5 October 1976; 7 September 1977
 Lieutenant commander: 5 October 1976
 Lieutenant: 30 November 1976



Navy physical therapist cares for patient in a therapeutic pool.

Focus in '77. The emphasis in Navy medical care is now on support to the operating forces, and on medical audits, credentialing, implementation of the Privacy Act, regionalization, and CHAMPUS changes. Supporting the operating forces is perhaps the most important: we are challenged to improve our efforts in providing top-quality health care for the fleet. This is our number one priority in the forthcoming year. I urge each of you to consider this goal in your actions



LTJG F.R. Tittman (left), medical construction liaison officer, talks with engineer at NMMC.

more accurately the scope and level of their health care services. Currently, 26 Navy medical regions are operating, with 175 assigned component facilities. We are developing a model to assess the effectiveness of regionalization. We particularly want to determine whether regionalization has attained its goal: providing adequate and timely medical care, especially to the operating forces.

The Bureau of Medicine and Surgery recently issued BUMED Instruction 6320.54 to provide guidance and procedures for medical care evaluation. This evaluation program is required by the Joint Commission on Accreditation of Hospitals to accredit Navy medical centers and hospitals. All MSC officers should be thoroughly familiar with medical care evaluation criteria, because the program has great impact on the Medical Service Corps, especially in the patient affairs area. In the essential function of assessing the quality of patient care, the MSC staff must provide administrative expertise and coordination for the clinical staff. Special emphasis should be placed on ensuring that members of our fine Navy Nurse Corps participate in the evaluation.

and plans, for we *must* take positive steps in this direction. Should you develop new ideas to improve our services to the fleet, send them to me so that we may share your support in this critical area.

The naval medical regionalization program, initiated in July 1971, is complete except for the New Orleans and Okinawa areas. During the past year, Naval Hospitals Beaufort and Key West were consolidated as echelon 4 component commands of Naval Regional Medical Centers Charleston and Jacksonville, respectively. Naval Hospitals Corpus Christi, Memphis, and Orlando were redesignated naval regional medical centers to reflect

Modern technology. In the area of word processing—recording words with dictating machines and automating typing—our medical centers and hospitals have, for more than 15 years, used the most advanced central dictation systems available. Transcription sections have progressed from electric typewriters to programmable, high-speed typing systems that use magnetic tape. We have successfully tested minicomputers for medical word processing. These computers use central dictation, direct input transcription, and medical terminology standardized and stored in the system; in pilot programs, their output of up to 2,000 words a minute rapidly overcame large backlogs and eliminated excessive delays in preparing medical records. Similar systems can be expected for large medical tran-

scription sections in other Navy medical centers and hospitals.

Another system being studied is the micromation of patients' treatment records. The current intensive search, review, study, planning and programming for an acceptable way of microformatting medical records will lead to a pilot test of a prototype system in one Navy hospital. Our goal is a system that will meet all our requirements for microfilming inpatient and outpatient records, replacing day-to-day use of paper records. If the pilot test is successful, miniaturized records will be used throughout the Medical Department. Important benefits should be realized through savings in filing equipment, floor space, and the expense of transferring records to the records center for long-term storage. The efficiency of managing patients' records will improve. However, because of the present state of the art of microfilm, the unique problems of medical records, technical factors, and other problems, we cannot yet be sure that we can find a system to meet our requirements. Microform systems for government records require approval by the General Services Administration; microform therefore cannot be implemented until an acceptable system, easy to update and proven in hospital use, is obtained and authorized.

Finally, I am pleased to report that I continue to hear favorable comments on the performance of MSC officers throughout the Navy and Marine Corps. You are accepting greater responsibilities and assuming more complex and varied tasks in a highly commendable manner. I am proud to be associated with each of you. Best wishes on our 29th anniversary.

Sincerely,

CAPT A.J. Schwab, MSC, USN
Chief, Medical Service Corps

Instructions and Directives

Medical Care Evaluation Program

Each naval regional medical center and hospital must issue instructions for medical care evaluation based on recent general guidelines from BUMED.

As required by the Joint Commission on Accreditation of Hospitals, the Medical Department's Medical Care Evaluation Program consists of patient care audit, utilization review, and credentialing. The medical care evaluation committee at each facility should include these functions, which may be assigned to separate subcommittees. Other standing boards and committees, and other support personnel shall help maintain high-quality patient care.

Staff members involved in medical care evaluation shall be kept informed of developments in this field. To this end, medical centers and hospitals are encouraged to subscribe to the JCAH publication, *Quality Review Bulletin*.—BUMED Instruction 6320.54 of 1 March 1976.

Revised family member prefix codes

Separate family member prefix codes are provided for active-duty and retired military personnel for use in color-coded, terminal-digit SSN filing systems. The new codes will facilitate identification and handling of dependents' outpatient treatment records and medical X-ray jackets.

Commands should use revised prefix codes for new accessions, and change prefix codes of current jackets when they are pulled from or returned to the file, or when time permits. Mass screening of jackets is not required. Commands should handle inactive jackets with standard disposition procedures. Changes in the jacket prefix code should be entered on the patient's card in the locator/alphabetic cross-reference file between name and jacket number.—BUMED Instructions 6322.11 and 6760.1, change transmittal 1 of 31 March 1976.

Revised medical holding company reporting procedures

Procedures have been revised for reporting length of stay of active-duty military personnel in medical hold status each month. Also, reports must now include the average length of stay of individuals in medical holding companies. Medical holding companies will be authorized at Navy drug and alcohol rehabilitation centers.—BUMED Instruction 1306.1, change transmittal 2 of 8 April 1976.

Changes in Medical Service Corps full-time training

The Marine Corps Amphibious Warfare Course has been reinstituted in the Medical Service Corps full-time training program. The course prepares MSC officers for command and staff duties at the battalion/squadron level, and for staff duties at regiment/group and Marine amphibious brigade levels. Topics covered include amphibious operation, military management, human relations, problem solving and decision making, computers, command relationships, and interstaff coordination requirements. Secret security clearance is required.

Revised descriptions of the purpose and scope of the Command and Staff College Course are also included in this change transmittal.—BUMED Instruction 1520.12F, change transmittal 1 of 14 April 1976.

Medical equipment maintenance and repair support to operating forces

To improve medical equipment and repair service to the operating forces, the following actions are directed:

- The Naval Medical Materiel Support Command (NAVMEDMATSUPPCOM) shall standardize equipment and repair parts in the operating forces, ensure that on-board equipment is provisioned with high-mortality spare parts, monitor preventive maintenance programs, ensure equipment reliability, and provide maintenance assistance to the operating forces as needed.
- Naval regional medical centers and hospitals shall establish work schedules with units in home ports for required maintenance and repair of medical equipment. They shall establish liaison with local ship information offices, and contact arriving vessels to schedule maintenance and repairs. They shall report problems and ask for assistance, when needed, from NAVMEDMATSUPPCOM.
- Operating forces shall contact their medical and dental fleet liaison office to request maintenance and repair. They shall schedule preventive maintenance of equipment before deployment to ensure reliability of equipment.—BUMED Notice 6700 of 22 April 1976.

Upward Mobility Program

The Upward Mobility Program provides career advancement opportunities for lower level employees who show potential for more demanding work. Upward

Mobility Programs are required at field activities employing 100 or more civilians, and encouraged for smaller activities.

Commanding officers should identify civilian positions suitable for inclusion in this program. "Bridge" or trainee positions shall be established to qualify the selectee for the identified, higher-grade position. Individuals selected for upward mobility positions should show potential for technical, administrative, and craft or trade occupations; after training, they should be able to perform the duties of the permanent position.

Commands must propose positions suitable for upward mobility in a letter to BUMED Code 008, before identifying the ceiling point to establish the bridge position. When the selectee qualifies for the permanent target position (usually after one year), the ceiling point reverts to the command or to BUMED for use in another upward mobility project.

Commanding officers shall submit upward mobility proposals to BUMED Code 008 before 1 September 1976 for consideration in the FY77 program. Commands must inform BUMED whether the selectee succeeds or fails in qualifying for the target position. Semi-annual status reports on approved upward mobility proposals should be submitted to BUMED Code 008 by the 15th of each August and February.—BUMED Instruction 12713.3 of 4 May 1976.

New blood pressure standards for induction and enlistment of male personnel

Hypertension will be a cause for rejecting men for induction and enlistment when preponderant systolic blood pressure readings are over 159 mm, or when preponderant diastolic blood pressure readings are over 90 mm, regardless of age. However, this does not apply to discharge and immediate reenlistment of males.

Army regulation 40-501, quoted in the *Manual of the Medical Department*, Article 15-27, has been changed to reflect the above standard. Provisions of MANMED Article 15-27(2)(19b) that conflict with the foregoing will be changed. MANMED Article 15-16(2)(j) is not affected by this change.—BUMED Notice 6110 of 4 May 1976.

Spill prevention, control and countermeasure

Budget limitations dictate that only spill prevention, control, and countermeasure (SPCC) projects that meet qualifications stated in NAVFAC Note 6240 of 28 January 1976 will be considered for pollution abatement funding. When reviewing potential oil pollution sources, medical and dental facilities shall follow the NAVFAC Note in developing SPCC projects and submitting them to the Naval Facilities Engineering Command (NAVFACENGCOM). Technical assistance and administrative guidance are available from NAVFAC-ENGCOM field divisions.

NAVFACENGCOM plans to survey selected Navy facilities that handle petroleum to identify deficiencies

and to approve SPCC projects for pollution abatement funding.—BUMED Note 6240 of 12 May 1976.

FY77 residency/fellowship training programs

Fully accredited residency training programs are conducted at naval regional medical centers and other Medical Department facilities in 35 specialties and subspecialties (see chart). Applicants for these positions must qualify for and accept a commission in the regular Navy or Naval Reserve.

Some positions are available for Medical Corps officers to train in civilian medical institutions. Such out-service training is offered when no inservice training program is available for a clearly defined Medical Department specialty requirement.

Aerospace medicine training is conducted at the Naval Aerospace Medical Institute, Pensacola, Florida. The six-month course covers academic and clinical subjects, environmental stress, and basic flight training. Six-month courses for undersea medical officers, held at the Naval Undersea Medical Institute, Groton,

RESIDENCIES/FELLOWSHIPS IN NAVAL ACTIVITIES INDICATING POSITIONS AT EACH YEAR LEVEL BY ACTIVITY

		Years of Training offered	Number of positions each year	Bethesda	Camp Pendleton	Charleston	Jacksonville	Oakland	Pensacola	Portsmouth, VA	San Diego	Other
Aerospace Medicine	**	3	6						6			
Anesthesiology	**	2	18	4				4		4	6	
Anesthesiology Research		2	1	1								
Dermatology	**	3	6	2							4	
Family Practice		3	35		9	9	9		8			
Hand Surgery		1	1								1	
Internal Medicine and Subspecialties	**	3	30	6				4		8	12*	
Cardiovascular Disease		2	4	2							2	
Clinical Immunology & Allergy		2	1	1								
Endocrinology & Metabolism		2	2	1				1				
Gastroenterology		2	3	2							1	
Hematology/Oncology		2	4	1							3	
Nephrology		2	1							1		
Pulmonary Disease		2	4	1						1	2	
Neurology		3	3	3								
Neurosurgery	**	4	1	1								
Nuclear Medicine		2	3	2				1				
Obstetrics & Gynecology		4	16	3				3		6	4	
Gynecologic/Endocrinology		2	1					1				
Maternal & Fetal Medicine		2	1	1								
Occupational Medicine	**	3	1									1
Operational Medicine		4	5								5	
Ophthalmology	**	3	8	3				2			3	
Orthopedic Surgery	**	4	12	2				3		3	4	
Otolaryngology	**	4	8	2				3			3	
Pathology		4	10	3				2		2	3	
Pediatrics		3	16	3				3		5	5	
Plastic Surgery		2	1							1		
Preventive Medicine (General)	**	3	1									1
Psychiatry	**	3	11	4				3		4		
Radiology	**	3	14	4				3			7	
Surgery	**	4	12	2				2		4	4	
Peripheral Vascular Surgery		1	1								1	
Surgical Research		2	1	1								
Thoracic & CV Surgery		2	3	1							2	
Urology		4	6	1				1		2	2	
TOTALS:			251	57	9	9	9	36	14	41	74	2

* This is a three year program.

** Indicates number of years training beyond GME year level one.

Connecticut, cover diving, submarine, and nuclear medicine. Graduates of aerospace and undersea medicine training serve two years in an operational duty assignment after they complete the course.

Applications for training should be submitted to the Commanding Officer, Naval Health Sciences Education and Training Command, Code 4, National Naval Medical Center, Bethesda, Maryland 20014. Applications should include a thorough evaluation of the applicant by the commanding officer. Interviews by chiefs of service are recommended but not mandatory. BUMED's professional advisory board will first consider each applicant for training in the specialty indicated, then for the institution requested. Applicants will be notified of the results in October 1976. BUMED will make every effort to sponsor a resident in training until he or she meets specialty board requirements.

The commanding officer of the naval facility where the resident trains will submit periodic progress reports to BUMED via HSETC. For residents sponsored in civilian institutions, the chief of service should forward to HSETC a letter indicating the resident's progress and potential for further training.—BUMED Instruction 1520.10G of 12 May 1976.

Certifying completion of graduate medical education

All graduate medical education trainees are urged to attain board certification in their specialty, and to complete further graduate medical education to enhance their professional competence. To do so, trainees need certificates or certifying letters documenting training already received. Five criteria, detailed in this instruction, will be followed for awarding such certificates or certifying letters to trainees.

Three months before trainees complete training, their commanding officer shall submit to the Naval Health Sciences Education and Training Command (HSETC) the name, grade, social security number, designator, specialty and dates of training of each trainee. HSETC will prepare the certificate or letter for the Surgeon General's signature, and return it to the command for presentation.—BUMED Instruction 1520.22 of 18 May 1976.

Transcript of intern service

Commanding officers shall provide a transcript of intern service (NAVMED 1520/7) to each medical officer who completes the first year of graduate medical education. This transcript should include:

- a detailed record of each service attended, with dates of attendance.
- signatures of the chairmen of these services, and the commanding officer's countersignature.
- the hospital's official seal.

A copy of this transcript must be sent to BUMED Code 314. NAVMED Form 1520/7 is available from BUMED Code 0011.—BUMED Instruction 1520.5B of 21 May 1976.

Notes & Announcements

CAREER LADDER FOR FLIGHT SURGEONS

BUMED Code 511, the career planning and counseling office for Navy flight surgeons, has developed a career "ladder" of flight surgeon billets and the rank at which each billet is usually held. Flight surgeons and their detailers may use this ladder to plan careers. The detailer's copy of the flight surgeon's individualized career ladder is filed in Code 511.

Flight surgeon billet rotations generally follow a three-part cycle: an education and training tour, followed by a deploying fleet assignment, and then a non-deploying aviation support assignment. With individualized career planning, and the establishment of aerospace medicine services in several naval regional medical centers to provide senior flight surgeon assignments, the Navy hopes to keep more physicians in aerospace medicine.

For copies of the flight surgeon career ladder, contact Bureau of Medicine and Surgery, Code 511, Department of the Navy, 2300 E St. N.W., Washington, D.C. 20372.

MORE ON OCCUPATIONAL HEALTH WORKSHOP

Here are details about the 19th Navy Occupational Health Workshop, announced in *U.S. Navy Medicine*, June 1976:

The workshop will be held 27 Sep-1 Oct 1976 at the Mills Hyatt House, Charleston, S.C., and is open to anyone who deals with the safety and health of active-duty Navy members or Navy civilian employees. Topics on the agenda are: radiation health, vector control, chemical carcinogens, fleet medical support, clinical thermal stress, occupational lung disease, respiratory protection, industrial ventilation, and occupational dermatoses. Continuing education seminars to be held in conjunction with the workshop are: occupational lung disease and pulmonary function testing (26-27 Sep), audiometric technicians' refresher course (2 Oct), federal workers' compensation (26 Sep), and basic industrial ventilation (26 Sep).

Send applications—including name, rank, position title, phone number, housing needs, and arrival and departure dates—to the Navy Environmental Health Center, 3333 Vine St., Cincinnati, Ohio 45220. Or call Autovon 989-3863, or (Area code 513) 684-3863. If you want to reserve a room, indicate whether you want a single (\$23) or double (\$36).

Annual Roster 1 August 1976

The following is a list of staff medical and dental officers of major fleets and forces, district medical and dental officers, commanding officers, executive officers, directors of administrative services, directors of clinical services, chief nurses of Medical Department activities, and division surgeons and dental officers of Marine divisions, Marine aircraft wings and Marine brigades.

CINCPACFLT/CINCPAC	RADM R.G.W. WILLIAMS, JR., MC, USN (ADDU) CAPT R.W. BRUCE, DC, USN (ADDU)
CINCPACFLT	AO CAPT J. WOLF, MSC, USN
CINCLANT/CINCLANTFLT/SACLANT	RADM P.O. GEIB, MC, USN RADM G.A. BESBEKOS, DC, USN (ADDU)
CINCLANTFLT	AO CAPT C.O. WIMBERLY, MSC, USN
SACLANT	AO CDR W.I. CASLER, MSC, USN
CINCUSNAVEUR	CAPT H.E. SHUTE, MC, USN (ADDU) CAPT R.S. NOLF, DC, USN (ADDU)
COMNAVFOR JAPAN	CAPT G.E. GORSUCH, MC, USN (ADDU) CAPT W.R. MARTIN, DC, USN (ADDU)
COMNAVLOGISTICS	RADM R.G.W. WILLIAMS, JR., MC, USN AO LCDR J. WILSON, MSC, USN
COMNAVAIRLANT	CAPT R.J. SEELEY, MC, USN CAPT R.H. HOWARD, DC, USN (ADDU)
COMNAVAIRPAC	CAPT K.H. REICHARDT, MC, USN CAPT J.E. HYDE, DC, USN (ADDU) AO LCDR R.G. MCCURRY, MSC, USN
COMSUBLANT	CDR W.B. MAHAFFEY, MC, USN
COMSUBPAC	CDR R.T. LARSEN, MC, USN CAPT R.W. BRUCE, DC, USN (ADDU)
CNET (NAS PENSACOLA, FL)	RADM R.D. NAUMAN, MC, USN (ADDU) CAPT J.W. PENTECOST, DC, USN (ADDU) AO CAPT S.D. BARKER, MSC, USN (ADDU)
CNATECHTRA (NAS MEMPHIS, TN)	CAPT G.W. MATTHEWS, JR., MC, USN (ADDU) CAPT T.H. MAYO, DC, USN (ADDU) AO LCDR W.F. BENEDICT, MSC, USN (ADDU)
CNAT (NAS CORPUS CHRISTI, TX)	CAPT J.R. LUKAS, MC, USN (ADDU)
COMNAVSURFLANT	CAPT D.T. LANSINGER, MC, USN
COMNAVSURFPAC	CAPT J.W. JOHNSON, MC, USN AO LCDR B.L. OZMENT, MSC, USN
COMEASTSEAFRON	RADM G.A. BESBEKOS, DC, USN (ADDU)
COMSC WASHDC	CAPT N.D. WILKIE, DC, USN (ADDU)
COMFAIRCARIB	CAPT W.E. QUILTER, JR., DC, USN (ADDU)
COMFAIRMED	CAPT R.D. CULLOM, DC, USN (ADDU)
COMFAIRWESPAC	CDR J.V. LOWMAN, DC, USN (ADDU)
COMICEDEFOR	CAPT M.C. CLEGG, DC, USN (ADDU)
COMSERVPAC	CAPT R.W. BRUCE, DC, USN
COMPHIBPAC	CAPT E.F. SOBIESKI, DC, USN (ADDU)
COMCBLANT	CAPT L.R. PISTOCCO, DC, USN (ADDU)
COMPHIBLANT	CAPT H. MULLER III, DC, USN (ADDU)
COMWESTSEAFRON	CAPT J.B. HOLMES, DC, USN (ADDU)
COMSCLANT	CAPT E.M. PENNELL, JR., DC, USN (ADDU)

COMTRAWING 4	CAPT J.A. MCKINNON, JR., DC, USN (ADDU)
CGMARTC	CAPT R.K. HILL, DC, USN (ADDU)
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NORFOLK NAVAL SHIPYARD, PORTSMOUTH, VA	DO CAPT H.S. TUGWELL, DC, USN (ADDU)
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NAVREGDENCEN, GREAT LAKES, IL	CO CAPT C.J. MCLEOD, DC, USN DCS CAPT R.D. PRINCE, DC, USN DAS CDR M.K. LAW, MSC, USN
NAVAL DENTAL RESEARCH INSTITUTE, NAVAL BASE, GREAT LAKES, IL	CO CAPT M.R. WIRTHLIN, DC, USN
NAVAL HOSPITAL CORPS SCHOOL, GREAT LAKES, IL	CO CDR V.A. SWINDALL, MSC, USN XO LCDR F. BRIAND, MSC, USN SR NURSE CDR C. CLUNAN, NC, USN
NAVAL ENVIRONMENTAL HEALTH CENTER, CINCINNATI, OH	OIC CAPT T.N. MARKHAM, MC, USN MED ADM OFF LT R.L. WILLIAMSON, MSC, USN
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NAVHOSP, GUANTANAMO BAY, CUBA	CO CAPT T.J. TRUMBLE, MC, USN DAS LCDR W.E. BRANSCUM, MSC, USN CH NURSE CDR M. LUKACS, NC, USN
NAV DENCLINIC, GUANTANAMO BAY, CUBA	CO CAPT J.R. BOHACEK, DC, USN DCS CAPT W.J. SCOTT, DC, USN DAS LCDR D.L. PRICE, MSC, USN
COMNAVBASE GUANTANAMO BAY, CUBA	DO CAPT J.R. BOHACEK, DC, USN (ADDU)
NAVHOSP, ROOSEVELT ROADS, PR	CO CAPT W.J. WAGNER, MC, USN DAS CDR J. DEWITT, MSC, USN CH NURSE CDR B. SLATER, NC, USN
NAVREGDENCEN, ROOSEVELT ROADS, PR	CO CAPT W.E. QUILTER, JR., DC, USN DCS CAPT W.H. EBERT, DC, USN DAS LT L.R. MOCK, MSC, USN
ELEVENTH NAVAL DISTRICT	DMO RADM D.E. BROWN, JR., MC, USN (ADDU) DIR DENACTYS RADM W.L. DARNALL, JR., DC, USN (ADDU) AO CDR J.B. KNIGHT, MSC, USN (ADDU)
NAVREGMEDCEN, CAMP PENDLETON, CA	CO CAPT R.F. MILNES, MC, USN DCS CAPT J.J. GUNNING, MC, USN DAS CDR F.C. PITTINGTON, MSC, USN CH NURSE CAPT P. PORTZ, NC, USN

NAVDENCLINIC, CAMP PENDLETON, CA	CO CAPT B.C. SHARP, DC, USN DCS CAPT J.D. MAHONEY, DC, USN DAS LCDR J.D. GALBREATH, MSC, USN
MARINE CORPS BASE, CAMP PENDLETON, CA	CAPT B.C. SHARP, DC, USN (ADDU)
COMASW/AEWWINGPAC	DO CAPT J.E. HYDE, DC, USN (ADDU)
NAVREGMEDCEN, LONG BEACH, CA	CO CAPT E.P. RUCCI, MC, USN DCS CAPT J.A. ZIMBLE, MC, USN DAS CDR D.E. SHULER, MSC, USN CH NURSE CAPT A. WILLIAMS, NC, USN
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NAVREGMEDCEN, SAN DIEGO, CA	CO RADM D.E. BROWN, JR., MC, USN DCS CAPT B.L. JOHNSON, MC, USN DAS CAPT A.C. HARRIS, MSC, USN CH NURSE CAPT D. CORNELIUS, NC, USN
NAVREGDENCEN, SAN DIEGO, CA	CO RADM W.L. DARNALL, JR., DC, USN DCS CAPT E.J. HEINKEL, JR., DC, USN DAS CDR R.W. JOHNSON, MSC, USN
NAVAL HEALTH RESEARCH CENTER, SAN DIEGO, CA	CO CAPT E.F. COIL, MC, USN XO CDR N.H. BERRY, MSC, USN
COMNAVBASE, LOS ANGELES, CA	DO CAPT H.W. HODSON, DC, USN (ADDU)
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NAVAL ENVIRONMENTAL & PREVENTIVE MEDU #6, PEARL HARBOR, HI	OIC CDR T.R. BYRD, MC, USN AO LT J.M. COSENZA, MSC, USN
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NAVREGDENCEN, WASHINGTON, DC	CO CAPT S.T. ELDER, DC, USN DCS CAPT A.E. SORENSON, DC, USN DAS CDR P.T. RAY, MSC, USN
ARMED FORCES INSTITUTE OF PATHOLOGY, WASHINGTON, DC	DEP DIR CAPT E.C. COWART, JR., MC, USN
ARMED FORCES RADIOBIOLOGY RESEARCH INSTITUTE, BETHESDA, MD	DIR COL L.W.R. STROMBERG, USA AO LCDR P.H. MOORE, MSC, USN
NAVAL MEDICAL DATA SERVICES CENTER, BETHESDA, MD	CO LCDR J.R. KNIGHT, MSC, USN XO LCDR F.G. ANDERSON, MSC, USN
NAVHOSP, PATUXENT RIVER, MD	CO CDR J.R. ERIE, MSC, USN DAS LCDR E.R. CHRISTIAN, MSC, USN CH NURSE CAPT D.H. HOOKER, NC, USN
NAVHOSP, QUANTICO, VA	CO CAPT R.F. SCHINDELE, MSC, USN DCS CAPT I.C. MAZZARELLA, MC, USN DAS CDR R.B. HINDS, MSC, USN CH NURSE CDR M.F. HALL, NC, USN
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NAVREGDENCEN, NAPLES, ITALY	CO CAPT R.D. CULLOM, DC, USN DCS CAPT J.T. JANUS, DC, USN DAS LCDR R.S. SKELLY, MSC, USN
NAVAL ENVIRONMENTAL AND PREVENTIVE MEDICINE UNIT NO. 7, NAPLES, ITALY	OIC CAPT R.L. MARLOR, MC, USN AO LCDR J.F. CONNOLLY, MSC, USN
JAPAN	
NAVREGMEDCEN, YOKOSUKA, JAPAN	CO CAPT G.E. GORSUCH, MC, USN DAS LCDR T.E. THOMAS, MSC, USN CH NURSE CDR E. GRAVES, NC, USN
MARIANA ISLANDS	
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NAVREGDENCEN, GUAM	CO CAPT P.S. COOMBS, DC, USN DCS CAPT G.A. SHORT, DC, USN DAS LCDR L.R. MAASSEN, MSC, USN
COMNAV Marianas	CAPT P.S. COOMBS, DC, USN (ADDU)
CAIRO, EGYPT	
NAVMED RESEARCH UNIT #3, CAIRO, EGYPT	CO CAPT W.F. MINER, MC, USN AO LCDR W.A. FERRIS, MSC, USN SR NURSE CDR M. SWETONIC, NC, USN

ADDIS ABABA, ETHIOPIA

NAVMED RESEARCH UNIT #5, ADDIS ABABA CO CAPT C.K. WALLACE, MC, USNR
AO LCDR D.E. COLE, MSC, USN

TAIWAN

NAVHOSP, TAIPEI, TAIWAN CO CAPT S.H. LING, MC, USN
DAS CDR K.L. DARR, MSC, USN
CH NURSE CDR A. HARRISON, NC, USN

NAVMED RESEARCH UNIT #2, TAIPEI, TAIWAN CO CAPT P.F.D. VAN PEENEN, MC, USN
AO LCDR R. ROBINSON, MSC, USN

PHILIPPINES

NAVHOSP, SUBIC BAY, RP CO CAPT E.L. BINGHAM, MC, USN
DAS CDR W.L. BLANKENSHIP, MSC, USN
CH NURSE CDR D.A. YELLE, NC, USN

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DCS CAPT N.H. TRACY, JR., DC, USN
DAS LT C.E. LAND, MSC, USN

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DAS LCDR R.A. MORIN, MSC, USN
CH NURSE CDR E. SULLIVAN, NC, USN

COMNAVACT, SPAIN CAPT G.B. CROSSMIRE, DC, USN (ADDU)

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CAPT A.R. SMITH, DC, USN
AO CAPT E.T. STEWARD, MSC, USN

HEADQUARTERS, FMF ATLANTIC CAPT R.R. PALUMBO, MC, USN
FORDO CAPT M.C. KOHLER, DC, USN
AO LCDR R.F. COXE, MSC, USN

SECOND MARINE DIVISION SURGEON CAPT R.J. ZULLO, MC, USN
SECOND DENCO CAPT R.A. GASTON, DC, USN
22ND DENCO FORTRPS CAPT R.S. DAVIDSON, DC, USN

SECOND MARINE AIRCRAFT WING CAPT E.L. GEHRY, MC, USN (ADDU)
12TH DENCO CAPT L.M. MULBROW, DC, USN

HEADQUARTERS, FMF PACIFIC CAPT B.C. JOHNSON, MC, USN
FORDO CAPT T.C. ENGER, DC, USN
AO CDR C.A. ROPER, MSC, USN

FIRST MARINE DIVISION CDR R.C. HODGES, MSC, USN
FIRST DENCO CAPT B.F. KRESL, DC, USN

FIRST MARINE AIRCRAFT WING CAPT P.C. BIGLER, MC, USN
11TH DENCO CAPT R.E. MOORE, DC, USN
AO LCDR T. MEDLOCK, MSC, USN

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THIRD MARINE DIVISION SURGEON CDR C.M. DAY III, MC, USN
THIRD DENCO CAPT F.R. RULIFFSON, DC, USN
AO LCDR G.O. MCCracken, MSC, USN

THIRD MARINE AIRCRAFT WING CAPT G.E. BALLYEAT, MC, USN
13TH DENCO CAPT J.G. CHUDZINSKI, DC, USN
AO LT M. ICZKOWSKI, MSC, USN

FLDMEDSERVSCOL, CAMP PENDLETON, CA CO CAPT W.H. JONES, MSC, USN
XO CDR E.N. CONDON, MSC, USN

FLDMEDSERVSCOL, CAMP LEJEUNE, NC CO CAPT L.W. GAY, MSC, USN
XO CDR J.M. CORRELL, MSC, USN

BUMED SITREP

TOXICOLOGY UNIT . . . The Naval Medical Research Institute, Bethesda, Md., is establishing a Toxicology Detachment at Wright-Patterson Air Force Base near Dayton, Ohio. The detachment will be staffed by an initial allowance of 12 officers, enlisted personnel and civilians. It will conduct research to establish permissible exposure limits for chemicals, and will monitor similar research conducted for the Navy, through an interservice support agreement, by the Air Force Toxic Hazards Research Unit (Aerospace Medical Research Laboratory, Wright-Patterson AFB).

FEDERAL WOMEN'S PROGRAM . . . Loretta J. Jackson has been named BUMED's first full-time Federal Women's Program coordinator. She will develop programs and suggest policies to assure equal opportunity for the Navy Medical Department's women. She'll also keep BUMED commands informed about, and help them implement the Federal Women's Program. Questions? Call Autovon 294-4179 or (Area code 202) 254-4179.

PHYSICAL FITNESS . . . The Chief of Naval Operations has approved a new physical fitness program for all Navy personnel. OPNAV Instruction 6110.1 says Navy members must be "physically capable of withstanding the stress of prolonged physical activity, enduring fatigue and maintaining combat effectiveness." All personnel are required to maintain physical fitness that enables them to perform their duties and to present a trim military appearance. Failure to maintain acceptable fitness may be reflected on officer fitness reports or enlisted performance evaluations.

Commands will encourage participation in physical fitness programs and, when possible, include physical conditioning in the normal workday. The aerobics program, which stimulates cardiovascular activity, is recommended for all personnel, ashore and afloat. Personnel are encouraged to earn 30 aerobic points each week.

TIGHTER WEIGHT STANDARDS . . . Stricter weight limits for all Navy personnel have been issued in BUPERS Instruction 6110.2A. Until now, maxi-

mum weight limits varied according to age and height; the new limits disregard age, varying only by height.

The instruction requires commands to identify obese and potentially overweight personnel. Individuals who exceed the maximum weight will not be automatically termed obese; body build, muscular development and bone structure will be considered. Enlisted personnel who show a lack of interest and effort in conforming to the new standards may receive administrative discharges or be rejected for reenlistment. For overweight officers, appropriate entries will be made on fitness reports.

The new instruction requires commands to establish preventive and remedial programs to promote weight consciousness. Command inspections will assess these programs.

GROOMING STANDARDS . . . Under new grooming rules announced by the Chief of Naval Operations, Navymen may not wear their hair longer than 4 inches, or thicker than 2 inches. Various hairstyles are allowed (including Afros) as long as hair is tapered from the lower hairline upward at least 3/4 inch, and outward no more than 3/4 inch. Block cuts are permitted if the tapered appearance is maintained. Moustaches may not extend below or more than 1/4 inch sideways beyond the corners of the mouth.

For women in uniform or in duty status, back hair may touch but not fall below the lower edge of the collar. Exaggerated styles (too full or too high), plaits, and braids are not authorized. Visible hairnets may be worn only if required for specific duty.

Although the changes are not a major departure from previous regulations, they're more specific and measurable. They allow some expression of individ-

uality while ensuring that personal appearance contributes to a good image of the military. Details will appear in Change 1 to U.S. Navy Uniform Regulations 1975.

POLITICAL ACTIVITY . . . SECNAV message 102357Z of March 1976 reemphasized the long-standing DOD policy that members of the Defense establishment may not become involved in partisan political affairs. During this election year it is particularly important that speeches, articles, and public comments not contain material which may be construed as political. Established procedures for review of speeches and articles submitted for publication should be closely followed. Media queries should be coordinated with the Office of the Assistant Secretary of Defense for Public Affairs if the response has partisan political implications. ASD(PA) has sole authority for the release of Defense information at the national level.

USUHS FACULTY APPOINTMENT . . . CAPT P.F. Dirk Van Peenen (MC) has been appointed professor and chairman of the Department of Preventive Medicine for the Uniformed Services University of the Health Sciences. An authority on zoonotic diseases, CAPT Van Peenen is commanding officer of U.S. Naval Medical Research Unit No. 2, Taipei, Taiwan.

NO THIRD BUILDING . . . The USUHS has scrapped its plans for a third building to house medical school faculty and research facilities. University president Dr. Anthony Curreri says the medical school can handle up to 700 students in the two buildings already funded by Congress.

ERRATUM

In "TCE, Asbestos, and a Host of Hazards" (*U.S. Navy Medicine* June 1976), and in our summary of BUMED Instruction 6260.22 of 18 March 1976 (*U.S. Navy Medicine* July 1976), perchloroethane was cited as an acceptable substitute for trichloroethylene. This is not correct. The correct substitute is *perchloroethylene*.

Features

Reducing Length of Patient Stay

VADM Willard P. Arentzen, MC, USN

Recent Navy Medical Department policy emphasizes returning hospitalized active-duty military patients to duty as early as possible in an effort to keep Navy health care delivery cost effective. Toward this end, Naval Regional Medical Center San Diego set these goals for FY76:

- Reduce average length of stay for active-duty inpatients 25% from FY75 without compromising the quality of health care services rendered.
- Reduce the time active-duty personnel are noneffective by returning them to duty in the shortest possible time.
- Discharge active-duty patients without delay once medically indicated.
- Improve administrative procedures to allow all inpatients to be discharged any time of the day or night.

We achieved our goals of a 25% lower average length of stay for active-duty inpatients by August 1975, only two months into FY76. The average length of stay then continued its downhill trend—by January 1976 it was 65% below FY75 rates (Table I).

This dramatic drop in length of patient stay brought many benefits. Our productivity has significantly increased: we can provide more health care without requiring a larger staff. Active-duty patients go back to duty earlier, providing more

support for the fleet. We save money on board and lodging, utilities, and janitorial services. We also have closed some wards, increased the occupancy of open wards, and consolidated wards and nursing service areas in order to make the best use of available resources.

But these rewards were a long way off when we first sat down to work out better ways to discharge patients. Our plan was built around specific actions designed to streamline our discharge system and move patients quickly back to duty. Specifically, we decided to:

- Discharge inpatients from the sick list once their narrative summary or medical board report was dictated, or an abbreviated clinical record completed.
- Establish a medical holding company.
- Arrange discharge alternatives for patients not eligible for the medical holding company.
- Eliminate the traditional duty party concept, maintaining the capability to discharge patients 24 hours a day, 7 days a week.
- Begin professional utilization review, including examination of requests for liberty, subsistence at home, convalescent leave, etc.
- Revise medical center instructions and develop new forms to expedite the discharge process.
- Monitor, concurrently and retrospectively, length of patient stay through statistical information provided by the Data Processing Service.
- Promote a service-oriented philosophy to improve administrative procedures.

I will discuss each of these steps in detail below.

STREAMLINING DISCHARGES

Before FY76, an active-duty patient could be discharged from NRMCMC San Diego only after a narrative summary of his hospital stay had been dictated, transcribed, and signed by his physician. The process sometimes delayed discharges one or two days. We streamlined this system, and now discharge patients to duty as soon as their narrative summary or medical board report is dictated, or as soon as an abbreviated clinical record is completed for patients hospitalized less than 48 hours for a minor condition.

By staggering work shifts and maintaining a specially trained watch, we can now discharge active-duty patients after normal working hours. About 8 active-duty patients are discharged after 1630 each day, 20 to 25 each weekend.

The traditional duty party concept added up to three days to active-duty patients' length of stay. If the physician failed to get his patient on the duty party list the day before anticipated discharge, the patient could not leave the hospital. By eliminating this administrative roadblock, we can now discharge active-duty patients as soon as clinically indicated; we don't need to wait for administrative scheduling. We also have eliminated wasted effort when a discharge is canceled.

These simple changes enable us to institute same-day discharges: active-duty inpatients now leave the sick list the same day their physician decides discharge is medically advisable. After the physician dictates a narrative summary or medical board report, or completes an abbreviated clinical record, he fills

VADM Arentzen is Surgeon General of the Navy and Chief of the Bureau of Medicine and Surgery, 2300 E St. N.W., Washington, D.C. 20372. At the time this article was written, he was commanding officer, Naval Regional Medical Center, San Diego, California 92134.

**TABLE I. Average Length of Stay
NRMC San Diego, July 1975-March 1976**

Time Period	Medical Center				Region			
	Active-Duty		All Patients		Active-Duty		All Patients	
	ALOS	Percent change from FY75	ALOS	Percent change from FY75	ALOS	Percent change from FY75	ALOS	Percent change from FY75
FY75	27.4	- - -	14.4	- - -	21.5	- - -	13.5	- - -
Jul 75	32.0	+17%	17.0	+18%	22.5	+ 5%	14.9	+10%
Aug 75	21.0	-22%	12.0	-17%	14.8	-31%	10.7	-21%
Sep 75	14.2	-48%	9.3	-35%	9.6	-55%	8.1	-40%
Average 1st quarter FY76	22.4	-18%	12.7	-12%	15.6	-27%	11.2	-17%
Oct 75	11.6	-58%	8.8	-39%	9.1	-58%	8.2	-39%
Nov 75	11.4	-58%	8.2	-43%	11.5	-46%	8.9	-34%
Dec 75	13.1	-52%	9.1	-36%	9.6	-55%	8.2	-39%
Average 2nd quarter FY76	12.0	-56%	8.7	-39%	10.0	-53%	8.4	-37%
Jan 76	10.0	-64%	7.6	-47%	7.5	-65%	7.0	-48%
Feb 76	10.5	-61%	7.9	-45%	8.1	-62%	7.3	-46%
Mar 76	10.2	-63%	7.8	-46%	8.8	-59%	7.4	-45%
Average 3rd quarter FY76	10.2	-63%	7.8	-46%	8.1	-62%	7.2	-47%

out a locally developed discharge form, describing any physical limitations or requirements for outpatient follow-up or medication. The patient brings this form with his inpatient clinical record to the Patient Affairs Service to be checked for completeness and accuracy. The disposition section supervisor then interviews the patient and verifies any previous personnel actions. After all is in order, the patient is asked to return later for discharge. (After 1600 and on weekends, discharge procedures are completely processed while the patient waits.) The patient can collect his clothes and belongings and pick up his pay record while the patient affairs staff completes his orders and health records. These are given to the patient on his return, and he is officially discharged. Each patient's name, social security number, rate, ward, and disposition location are then recorded on the day's discharge list.

We now discharge 35 to 70 active-duty patients each day with little difficulty. Patients no longer remain on the sick list solely to await administrative processing. The new procedure has enhanced the qual-

ity, completeness and control of active-duty inpatient clinical records. Acceptance by our medical staff, administrative staff and patients has been notably favorable.

One of our most successful moves was to establish a medical holding company in nearby renovated barracks where we could receive, process and transfer active-duty patients who no longer needed hospital care. But some active-duty patients were not eligible for the medical holding company. For them, we explored other possibilities: Marine Corps enlisted members can be discharged to a Marine casual company, for example; medical rehabilitation platoons are available for Marine recruits, and medical holding companies at recruit commands will accept Navy recruits.

Through arrangements with local commands, active-duty personnel who require further outpatient treatment now return to their command and continue treatment at one of our outpatient clinics, many of which are conducted at local command dispensaries by our medical center specialists. Patients a medical board deems fit for limited duty

and patients awaiting physical examination board decisions are discharged to the local naval station's transient barracks. Some patients can also be temporarily reassigned to duties in their naval enlisted classification while awaiting orders from the Bureau of Naval Personnel.

INSTRUCTIONS REVISED

After reviewing policies on subsisting at home and convalescent leave, we revised medical center instructions to keep the use of absence status categories to a minimum. If the patient is expected to return to the hospital, as he might for second stage tumor surgery, for example, convalescent leave must be approved by the director of clinical services. The new instruction stresses that the hospital staff must continually review each patient's requirement for an acute care bed.

The director of clinical services then began to scrutinize each physician's recommendation for subsistence at home or convalescent leave, and to suggest discharge alternatives where appropriate. For in-

stance, when an active-duty inpatient will be ready for full duty or continued outpatient treatment after a short convalescence, he can be discharged with an authorized delay in reporting of up to 30 days. This action removes the patient from the sick list while still providing time for convalescence. As a result of these changes, subsistence at home and convalescent leave authorizations for inpatients are now rare (Table II).

Next we reviewed our admission and discharge patterns and found that our inpatient population is most stable at 2400 every Monday. This became the weekly fixed point for Data Services to prepare a computer printout listing the service, ward location, admission date, diagnostic code, category, and length of stay of each inpatient. We asked department chairmen to report the primary diagnosis, discharge plan (medical board, transfer to Veterans Administration hospital, limited duty, medical holding company, or other), and justification for continued hospitalization on all patients hospitalized more than 60 days. After studying these reports, the director of clinical services worked with the department chairmen and the patient affairs and Red Cross staff to expedite patient discharges. He and the patient affairs officer met often with the medical staffs of several departments to explain discharge options, urge faster processing of paperwork, and ensure that social services were used fully.

By monitoring statistics we succeeded in arranging more suitable alternatives for long-term care. For example, we no longer keep oral surgery patients with wired jaws as inpatients for long periods. The number of people hospitalized longer than 60 days quickly dropped to less than 1% of inpatients, mainly in orthopedics and neurosurgery.

After this first success, we asked for a weekly report on patients hospitalized more than 30 days. A statistical review showed that 74% of patients in the Monday census stayed less than 14 days, 14%

TABLE II. Absence Status

Date	Subsisting at Home			Convalescent Leave			Total Absence Status
	Officers	Enlisted	Total	Officers	Enlisted	Total	
1 Jul 1974	48	7	55	0	55	55	110
1 Jan 1975	55	23	78	1	146	147	225
1 Jul 1975	10	84	124	5	27	32	156
1 Aug 1975	10	37	47	1	19	20	67
1 Sep 1975	7	14	21	1	17	18	39
1 Jan 1976	1	1	2	7	1	8	10
1 Mar 1976	1	0	1	1	1	2	3

TABLE III. Workload Increase

Month	Admissions	Discharges	Live Births
Jul 1974	2,149	2,138	247
Aug 1974	2,238	2,324	292
Sep 1974	2,197	2,158	293
Oct 1974	2,209	2,191	299
Nov 1974	2,185	2,357	306
Dec 1974	2,002	2,171	322
Jan 1975	2,530	2,300	310
Feb 1975	2,178	2,245	289
Mar 1975	2,329	2,334	297
Apr 1975	2,343	2,350	309
May 1975	2,314	2,363	333
Jun 1975	2,273	2,275	350
FY75 Total	26,947	27,206	3,647
Jul 1975	2,497	2,776	317
Aug 1975	2,519	2,739	338
Sep 1975	2,599	2,619	379
Oct 1975	2,330	2,438	329
Nov 1975	2,344	2,454	319
Dec 1975	2,159	2,325	343
Jan 1976	2,603	2,439	336
Feb 1976	2,346	2,347	312
Mar 1976	2,703	2,739	333
Apr 1976	2,521	2,614	340
FY75 Monthly average	2,245	2,267	303
FY76 Monthly average (8 months)	2,462	2,549	335
Percent increase	+9.7%	+12.4%	+10.6%

stayed 14 to 30 days, and 7.4% stayed 30 to 60 days. To further reduce our length of patient stay, we then obtained individual weekly reports on patients in the 14- to 30-day category.

Providing earlier medical and physical examination boards and VA transfers helped us reduce these patient stays. On reviewing orthopedic patients hospitalized more than 30 days, we found 15 whose average length of stay was 90.5 days. Our solution: hold physical examination boards earlier. A review of psychiatry statistics

prompted us to speed up physical examination boards and VA transfers in that area.

As our last refinement, we will institute peer review by diagnostic categories, as envisaged by the Joint Commission on Hospital Accreditation. Our participation in the Professional Activity Study (PAS) sponsored by the Commission on Professional and Hospital Activities, Ann Arbor, Michigan, will allow us to compare our average length of stay with that of other PAS hospitals, ensuring that we maintain acceptable standards.

Although our average daily patient census has dropped, we process more work now with the same size staff. Table III shows this increase in our volume of work, as reflected in admissions, discharges and live births from FY75 to FY76.

We also saw improvement in our turnover rate, a measure of how rapidly patients move through the hospital. Calculated by dividing the monthly number of discharges by the average daily patient load, the turnover rate shows how many patients receive inpatient services per each occupied bed per month. Our turnover rate increased from 2 per month (January to June 1975) to 3.5 per month (September 1975 to March 1976) to over 4 per month since April 1976, giving interns and residents access to a greater number of patients.

We no longer waste board and lodging money on patients held too long on the sick list. More savings came when we closed nine wards. Occupancy rates in wards remaining open range from 60% to 95%, providing significant economies in operation of the nursing, food and janitorial services, and utilities. We have consolidated most inpatient wards in the central patient care building to make professional consultation between physicians more effective.

One final benefit: Formerly, long-term hospitalization of many ambulatory but socially-displaced junior enlisted men created discipline problems. By reducing their length of stay, we now have fewer disciplinary actions.

We plan to consolidate several outpatient clinics, the coronary care unit, and coronary extended care units into our central patient building, and to relocate selected patient affairs functions at a single site. We will continue to survey length of stay statistics and to educate staff members on discharge options. Our goal—greater health care productivity with the same resources—was not an impossible dream. We believe other Navy medical facilities can realize it, too.

Scholars' Scuttlebutt

Applying for Internship?

It's time to submit your applications for first-year internships at Navy medical facilities. Application forms were mailed in mid-May to scholarship students who will receive their M.D. degree between 1 December 1976 and 1 July 1977.

Applications must be received in the Bureau of Medicine and Surgery (Code 0011) by 1 September 1976. Candidates for graduate medical education are urged to submit their applications *before* this deadline, and to ensure that information required from their medical school is forwarded on time. Last year, many applications could not be considered because they lacked this academic information. School officials routinely provide recommendations to meet deadlines for the intern matching plan; but *unless they are specifically advised of the Navy's earlier selections*, school officials do not forward recommendations and transcripts until *after* the Navy has selected its interns. Make sure this doesn't happen to you!

Students Speak Out

On 6 May 1976, Navy scholarship students at St. Louis University School of Medicine attended a symposium on their future careers in Navy medicine. Speakers included CAPT William M. McDermott (MC), representing the Surgeon

General; Reserve medical officers on the faculty of St. Louis University, including one physician who had just returned from active duty; and a faculty member who retired from the Navy after 21 years as a medical officer.

Students expressed their concern about taxation of subsidies and competition for training opportunities.

Kudos for Subsidy Student

ENS Felipe C. Robinson, a Navy scholarship student at the University of Florida, placed second in this year's medical illustration photography competition sponsored by the Student National Medical Association (SNMA), Inc., Washington, D.C. He also picked up a Kerr Fellowship in clinical cardiology from the San Francisco Heart Association—one of two winners selected from 47 applicants.

Attention: Subsidy Students!

Want to receive *U.S. Navy Medicine* regularly? There's no need to subscribe: it's free for all Navy scholarship students. Just send your name and address to Scholarship Student Program, Naval Health Sciences Education and Training Command (Code 14), Rm. B37, Bldg. 141, National Naval Medical Center, Bethesda, Md. 20014.



Navy day at St. Louis University School of Medicine

NAVMED Newsmakers

"Ho hum," thought Hi Ho Silver, senior member of the camel corps. "If these guys want to play Lawrence of Arabia, it's no sand off my back." The unlikely sheiks: LTs **James D. Converse** and **David C. Edman**, and LCDR **William A. Ferris**. The occasion: a Medical Service Corps birthday party at Naval Medical Research Unit No. 3, Cairo. MSC officers aren't supposed to wear uniforms in Egypt, so they improvised. Their galabeyas were properly striped, and the MSC device was hitched to each fez. Hi Ho Silver wasn't impressed. Yawned the jaded beast: "Next they'll want to ride off into the sunset." Good thing for him the party didn't last 1,001 nights.



NAMRU 3: 1,001 nights

The old recruiting poster said "Young Men Wanted for U.S. Navy," but HM3 **Kathy J. Shanebrook** of NRMCMC San Diego had the last laugh. She's heading East to be one of the first 80 women to attend the U.S. Naval Academy—working and studying alongside 4,000 male students. Says the new midshipman: "That's not bad odds!"



Lightfoot: 15,000 miles

Every year, at Belly Board Award time, Navy gastroenterologists get nervous stomachs wondering which of them will be honored. This year, the winner is a radiologist: LCDR **Ronald L. Arenson** (MC) of NNMCMC, cited for his radiologic investigations of gastroenterological cases, outstanding diagnostic skills and teaching abilities. He's the second radiologist to hoard the Board.

HM1 **Hans Schmidt's** prize possession is a Donald Duck comic book. But this is no ordinary comic book: worth a dime in 1942, it sells for \$1,000 today. A serious collector of old comic books since 1973, and a dealer since 1975, the NRMCMC San Diego corpsman likes to help customers find older volumes too expensive to keep in stock. The most expensive comic book? "Marvel Mystery Number One," says HM1 Schmidt. "It was published in 1939, and it catalogues at \$5,000. But copies are so scarce that the last time a copy was sold it went for \$7,000." Does anyone collect *U.S. Navy Medicine*?

It started with a dare. Three years ago, HMCS **Paul T. Lightfoot's** wife and buddies bet him that he couldn't bicycle to work (at NRMCMC Oakland) and back every day. Since then, the light-footed chief has lived up to his name: he's ridden 15,000 miles without a major accident. Luck? Nope—HMCS Lightfoot doesn't soft-pedal when it comes to safety. He wears a bright red sweat suit, cleated shoes, and a cushioned helmet.

Arenson: 1 Belly Board



Shanebrook: 80 women



Clinical Notes

Discharge Planning Program

LCDR Elizabeth H. Weitzel, NC, USN

Mrs. J. needed help. Her husband, age 73 and partially paralyzed from a stroke, was ready to leave the hospital after six weeks. Although unable to care for him at home, Mrs. J. was reluctant to place him in a nursing home. Where could she get information on extended care facilities? Who could tell her about other community health resources?

To help people like Mr. and Mrs. J. who need discharge counseling, Naval Submarine Medical Center Groton, Connecticut appointed a nurse with public health training as discharge planner. The advantages of such a program are:

- More efficient use of physicians' and nurses' time.
- Continuity of health care after patient is transferred from hospital to home.
- Better communication between the family, the hospital, and community services.
- Shorter hospital stay for patients.

After we identified the need for a discharge planner, we searched the literature for guidance (1,2). We met with a public health nurse consultant from the State of Connecticut, and learned that many hospitals do not automatically refer patients to home care health agencies or other community facilities. Because there is so little contact between the hospital and outside agencies, patients are deprived of important health benefits. Nurse discharge planners can close this communication gap—they can serve as liaison between hospital staff, extended care facilities, and other community agencies. They can tell the patient what alternatives are available, and help him make a suitable choice.

We also spoke with the discharge planner at a nearby chronic care and special cancer treatment hospital, and asked community agencies what services they offer and how patients can obtain their help. Supervisors of Groton public health nursing agencies visited us to establish better communications between our medical center and the community.

Our program got under way in November 1974. A progress report is submitted to the medical center commanding officer on the number of patients referred each quarter, and the source, diagnosis, age, sex, and services required for each referral. In the program's

first ten months, there were 20 referrals from physicians, 33 from the nursing staff and 4 from other sources. The nurse discharge planner picked 15 more patients for discharge counseling. To make these first referrals, the planner contacted 122 people—patients' families and staff members of community agencies.

Here's how discharge planning works at Groton: The nurse discharge planner consults patient, relatives and medical staff to determine which agency would best maintain the patient's health. With the patient's consent, she forwards the patient's background information and physician's discharge orders to that agency. She later follows up with telephone calls or letters to see how patient and family are faring.

Our discharge planning program has functioned smoothly because the staff cooperates in referring patients and their relatives. Patient acceptance is good. One patient's wife spoke for many when she said, "I feel better now that someone will help us at home. Before, I didn't know how we would manage."

REFERENCES

1. Penbody SR: Assessment and planning for continuity of care from hospital to home. *Nurs Clin North Am* 4(2):303-310, 1969.
2. "Discharge Planning for Hospitals." Chicago: American Hospital Association, 1974.

Shigella and Salmonella

Salmonella and shigella are both pathogenic gram negative rods that can cause diarrhea, foodborne and waterborne disease outbreaks, and serious illness. But there are two important epidemiological differences:

- Fowls, mammals and reptiles are common salmonella reservoirs (except in typhoid). Because salmonella infection can be spread by many different animals, salmonella-caused foodborne disease is relatively common: the organism causes some 30% of foodborne outbreaks in the United States. But shigella, which live in the human gastrointestinal tract, have no nonhuman natural host. Shigella is therefore a relatively unusual agent of foodborne disease, causing only 1-2% of foodborne outbreaks in the U.S. Shigella is spread by the fecal-oral route. Outbreaks can usually be traced to a food handler's poor hygiene practices.

- Over 10,000 salmonella organisms are required to induce disease. In foodborne outbreaks, this means that food must sit at excessively high temperatures long enough for the organism to multiply many times. Shigellosis or bacillary dysentery, on the other hand, can be caused by as few as 10 organisms: the organism need not multiply in food for disease to occur, and food may be contaminated even if it has not been sitting at improper temperatures.

—From *Preventive Medicine Notes*, Navy Environmental and Preventive Medicine Unit No. 6, Naval Station Box 143, San Diego, California 92136.

LCDR Weitzel is discharge coordinator at Naval Submarine Medical Center, Groton, Connecticut 06340.

Fusing Porcelain to Ticon: A New Approach

CAPT Calvin D. Nester, DC, USN

Recent dramatic increases in the price of processed and refined gold used to fabricate gold and porcelain-fused-to-gold dental restorations have prompted dentists to seek satisfactory but less expensive substitute metals. Ticon, one of the metals being investigated, has been used by the dental profession for several years, with mixed feelings. Ticon's main advantage is its low cost: approximately \$13 per ounce, compared with \$200 for an ounce of the precious metal Jelenko "O." But this advantage has been outweighed by the lack of success when Ticon is used according to the manufacturer's recommendations; after failing many times, most dental laboratories have stopped using Ticon in fixed prostheses.

To work with Ticon, dentist and technician must reorient their thinking: it is a new material for crown and bridge procedures, with characteristics completely different from those of precious metals. While using Ticon according to the manufacturer's directions can result in repeated failures and frustration, Ticon can be handled successfully with another approach—one that uses commercially available materials to produce high caliber, low cost restorations.

PREPARATION

Natural teeth should be prepared to receive full coverage crowns. While three-quarter crown preparations may be used for single unit restorations and cast separately to control expansion, they are not recommended as bridge abutments; my experience with the three-quarter crown as a fixed partial

denture abutment has been disastrous. Since most fixed partial dentures are cast as a complete unit, our technicians find that they cannot control the expansion of the investment enough to produce three-quarter crowns, pontics, and full crowns in the same casting ring. An open margin on the three-quarter crown, or a poorly fitted full crown and casting always results.

To provide a good porcelain color and sufficient bulk for metal and porcelain at the gingival margins, the chamfer preparation should be used on the labial and buccal surfaces of teeth, and either a chamfer or feather edge margin on the remaining gingival surfaces. For the best aesthetic effect, margins should be placed subgingivally.

The master cast is then recovered from the final impression and individual removable dies are prepared. The dentist should define margins well to prevent the wax from overextending. The master cast is then articulated with the opposing cast.

Wax crowns or bridges are fabricated following standard procedures for constructing all metal crowns, or for coping-type crowns jointed as multiple units. Anterior crowns may be waxed to create a complete metal lingual surface extending to the crown's incisal edge. This technique strengthens the metal and reduces thickness at the crown's incisal edge, important advantages in cases of very close articulation. While some incisal translucence will be lost, this is not noticeable in most cases. Posterior crowns may be handled in the same manner by adding a porcelain "facing" to the buccal surfaces (Figure 1).

These methods do not preclude using porcelain to cover any crown or pontic partially or completely. The choice of technique depends upon the dentist's preference; while each technique provides a satisfactory result, one may be more advantageous than another in certain cases.

CAPT Nester is a member of the staff of the Prosthetic Department, Naval Regional Dental Center, Norfolk, Virginia 23511. He expresses his appreciation to all staff members there who contributed to the preparation of this manuscript.

For any wax pattern, the surfaces to which veneer porcelain is bonded should be approximately .5 mm thick. At this stage the major consideration is to provide enough wax bulk for casting; the recovered casting can later be reduced to a desirable .3 mm underlying the veneer porcelain. If porcelain will be added to occlusal surfaces, the wax can be much thicker, as long as there is enough clearance for the porcelain.

SPRUNG THE PATTERN

Through much experimentation, I have found the following technique to be the best method for spruing the wax pattern. This technique produces castings as good as those made with precious or semiprecious metals.

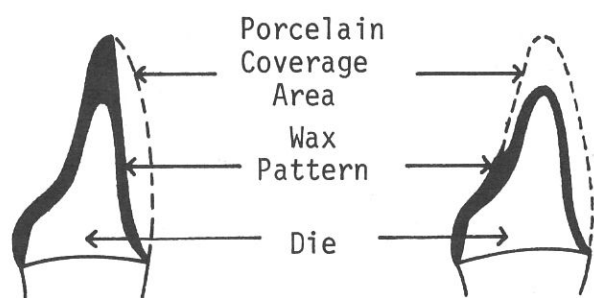


FIGURE 1. Cross section of two acceptable wax-up techniques.

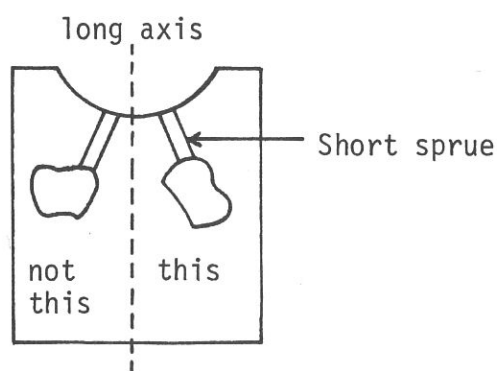


FIGURE 2. Recommended placement of patterns in casting ring.

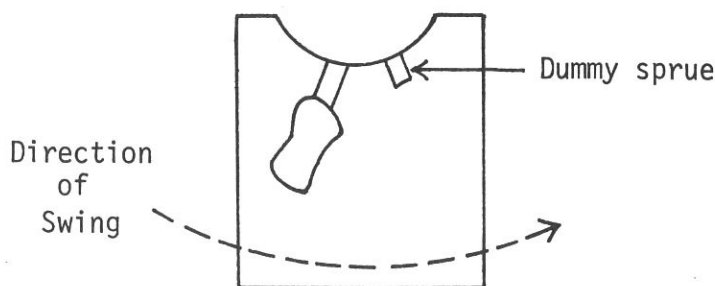


FIGURE 3. Forward position of dummy sprue.

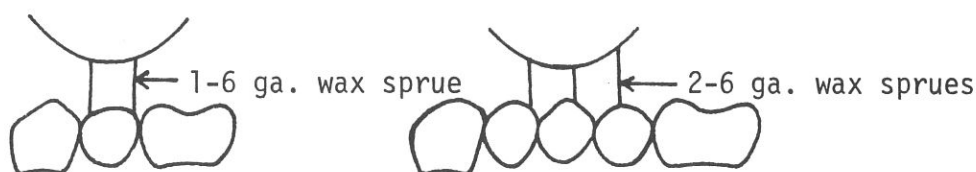


FIGURE 4. Method for spruing multiple units.

Let us first consider the single metal crown. It is most economical to cast many single metal crowns in one casting ring. The individual wax units are attached to the sprue former with 8-gauge wax, and arranged in a circle. Each unit is sprued on the lingual cusps of posteriors or the incisal edge of anteriors, so the entire wax pattern is below the sprue and each unit is set off from the long axis of the casting ring (Figure 2). To control their expansion, the single three-quarter crown patterns should be sprued and invested with other three-quarter crown patterns, not mixed with full crown patterns. If a single wax unit is to be sprued, add a shortened dummy sprue to the sprue former in an offset position—180 degrees opposite the main sprue. This dummy sprue can be used as a guide to position the casting ring in the casting machine before introducing molten metal; it will take a forward position in the casting machine cradle in line with the swing of the casting arm (Figure 3).

In multiple unit castings for fixed partial dentures, only one bridge wax pattern should be invested in each casting ring. A 6-gauge wax sprue should be attached to the center of the wax's pontic section, following the method used to sprue single crowns. As the number of pontics increases, a second 6-gauge wax sprue should be luted to the first and centered over the pontic section; no more than two wax sprues should be used (Figure 4). If the thickness of a particular unit is not known, an auxiliary sprue of 10-gauge wax may be used; heavy gauge wax sprues prevent "suck back" and spot porosity in

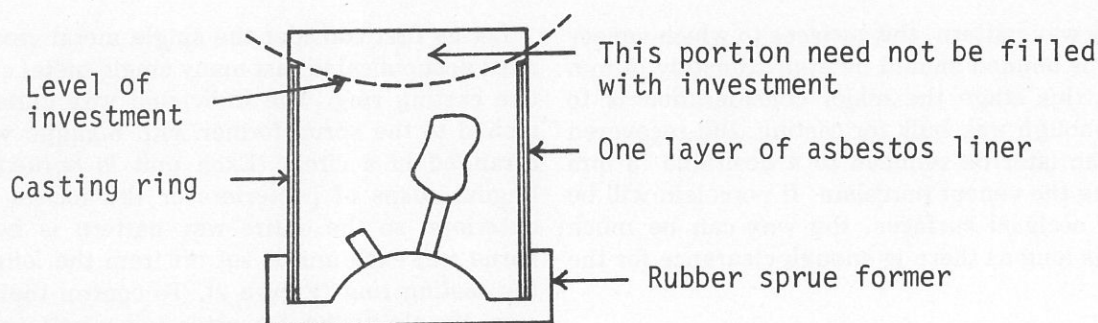


FIGURE 5. Proper depth of patterns in relation to investment material.

Ticon castings. A dummy sprue should again be placed 180 degrees opposite the main sprue.

Before investing patterns, a wetting agent is applied and gently dried. The casting ring is lined with one layer of asbestos. In a standard size casting ring, this asbestos liner will usually not reach the ring's top.

Ceramigold Investment seems to produce the best results. The casting ring is rarely filled to capacity with investment material: the technician vibrates only enough investment into the ring to submerge the patterns and extend 1/8 to 1/4 inch above them. The ring is then carefully rotated by hand so the investment material flows just above the level of the asbestos liner, forming a concave surface (Figure 5). (To accommodate large framework patterns, casting rings are sometimes bent into an elliptical shape before investing.) Immediately after investing, the casting ring is submerged in 100°F. water for 30 minutes.

After this hygroscopic soak, the sprue former is removed. The casting ring is placed for one hour in an oven preheated to 1350°F., after which the ring is ready to receive the molten metal. In small laboratories where the volume of work does not warrant continual use of burnout ovens, the technician may start the burnout in a cold oven, bring the temperature to 1350°F., hold this temperature for 45 minutes, and then cast.

CASTING

Casting is best done with a controlled melt technique using a Ticomatic casting machine. The lowest melt setting on the casting machine should be used to obtain a clean, smooth, light-gray casting with no porosity; at this setting, metal does not burn or overheat. Our laboratory uses a melt setting of #3, but this may vary from one casting machine to another. It may be necessary to make trial castings to

determine the best setting for individual Ticomatic machines. The casting cools on the bench, and is then recovered from the ring by tapping lightly on the investment. Sandblasting removes residual investment.

The casting should then be carefully examined. The technician will be pleasantly surprised at the accuracy of his castings when he fits them to the master dies; if not, he probably has not followed the procedure correctly.

After the casting is recovered, the thickness of metal must be reduced where facial veneer porcelain will be added. Our technicians carefully reduce these areas to .3 mm, and grind the casting with #220 Ticonium disks. Areas which will not receive porcelain are polished. The prepared casting is then thoroughly cleaned, preferably with an ultrasonic cleaner, by immersion in 95% alcohol for seven minutes followed by immersion in distilled water for seven minutes.

Castings are fired in the porcelain furnace with a temperature rise of 90°-100°F. per minute. The clean castings are placed on a Versa-Tray [LABCO Products, Inc., Jamaica, N.Y. 11432] in the porcelain oven under vacuum until the temperature reaches 1850°F., then immediately removed and bench cooled. The Versa-Tray (a wire support for the castings) barely touches the internal surface of the casting. Because the tray expands and contracts at approximately the same rate as the castings, it maintains the same position in relation to the castings, preventing them from sticking. This also helps eliminate porcelain crazing.

Since our porcelain bonding technique does not depend on the oxide coating which forms on the surface of the metal, this coating is carefully removed with silicon carbide disks. The casting is then recleaned using the previously described technique.

Coating the casting is the most important phase of

bonding porcelain to Ticon. If the technician eliminates this step, the porcelain will either craze or will not adhere to the metal. To ensure a good restoration, the clean casting must be coated with a material which bonds porcelain to metal, such as Metal Conditioner [Unitek Corp., 2724 S. Peck Rd., Monrovia, Calif. 91016]. The coating is applied to the porcelain bonding surfaces and allowed to dry on the edge of the oven muffle until it takes on a dull yellow-gold appearance. The casting is put back in the oven, and the temperature raised until it reaches 1760°F. under vacuum. The vacuum is then released, the temperature slightly lowered, and the casting removed from the oven and allowed to cool. Castings must be handled with forceps, not fingers; if they are contaminated by hands or bench, they must be cleaned again in the ultrasonic cleaner.

FINAL STEPS

Ceramco Paint Opaque is the easiest material to use for the opaque coat. A thin opaque coat is painted over the bonding agent and the material is placed in an oven which is raised to 1700°F. under vacuum and then to 1800°F. without vacuum. The material is then removed from the oven to bench cool.

Results as good as those described above can be obtained with Ceramco G porcelain or Vital VMK porcelain. To fuse Ceramco G porcelain to Ticon, the porcelain is added over the opaque coat and the material again placed in an oven which is raised to 1700°F. under vacuum and then to 1800°F. without vacuum. The baked porcelain is then contoured and

refined with silicon carbide disks, refined again with white silicon points, and then lightly air-blasted with aluminum oxide abrasive to produce a dull, smooth finish. The prepared units are placed in the ultrasonic cleaner for the prescribed period. Additional porcelain may be added for contour or in areas of shrinkage, and again baked in the oven at 1700°F. under vacuum and then 1800°F. without vacuum.

If the technician is satisfied with his final bake, he may want to stain and glaze the restoration with commercially available materials that produce excellent results. Once again, cleanliness must be stressed. If there is any doubt, it is best to use the ultrasonic cleaner. After the stain and glaze are added, the castings are placed in an oven that is raised to 1700°F. under vacuum and then to 1740°F. without vacuum. A natural glaze can be imparted to the porcelain simply by running the temperature to 1800°F. without vacuum. After the crown or bridge is removed from the oven and allowed to bench cool, its exposed metal surfaces are polished, and the restoration is ready to be inserted in the mouth.

SUMMARY

A technique has been described for fusing porcelain to Ticon. While this technique differs from that recommended by the manufacturer of Ticon, it requires no elaborate, exotic materials or machinery. All materials are commercially available, and most are stocked in any dental laboratory. Using this technique we have obtained excellent results, and have produced thousands of precise, beautiful and durable restorations.

DON'T MISS

Neurologic Complications After Acute Hemorrhagic Conjunctivitis

Investigators at Naval Medical Research Unit No. 2, Taiwan, have reported the first known case of neurologic disease associated with a rise in antibody titer to acute hemorrhagic conjunctivitis (AHC) viral infection.

In "Neurologic Complications with Elevated Antibody Titer after Acute Hemorrhagic Conjunctivitis," Irving J. Green, Ph.D., Tsu-Pei Hung, M.D., and Shiang-Ming Sung, M.D. report on nine patients who developed polyradiculomyeloneuropathy after AHC infection. Eight of these patients had neutralization

titers $\geq 1:16$ against the prototype J-670/71 strain of AHC virus in at least one serum sample. Studies of acute and convalescent sera showed a significant four-fold rise in antibody titer against AHC virus in one patient who developed neurologic complications five days after the onset of AHC infection.

The study appeared in the *American Journal of Ophthalmology* 80(5):832-834, November 1975. Reprints are available from Publications Office, NAMRU-2, Box 14, APO San Francisco, California 96263; ask for Report No. TR-671.

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